

HISTORY OF WEATHER OBSERVATIONS
Oglethorpe Barracks, Georgia
1827 - 1879

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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS	ii
INTRODUCTION	
Historical Overview	1
Goal of the Study	2
LOCATION OF OBSERVATIONS	3
INSTRUMENTATION	5
BIBLIOGRAPHY	
References	11
APPENDIX	
Appendix 1 – Methodology	12

LIST OF ILLUSTRATIONS

Figures

1. Map of Relevant Savannah Forts	1
2. Location of Oglethorpe Barracks	3
3. Drawing of Oglethorpe Barracks	4

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INTRODUCTION

Historical Overview

Over the years, several forts in the Savannah, GA area have been referred to as, “Oglethorpe Barracks.” Fort Jackson (1808-1902), located three miles east of downtown Savannah, was called “Fort Oglethorpe,” or “Oglethorpe Barracks” in the mid to late 1880s (1884-1889). Also, soldier barracks were constructed outside the remains of old Fort Wayne (1782-1790) in northeast Savannah during the period 1821-1851 and also were referred to as “Oglethorpe Barracks.” However, the location recognized as the traditional Oglethorpe Barracks in Savannah, especially by the U.S. Department of War, were the buildings constructed in the old Savannah historical district just northeast of Madison Square. Figure 1 shows the location of the forts in relation to Oglethorpe Barracks.

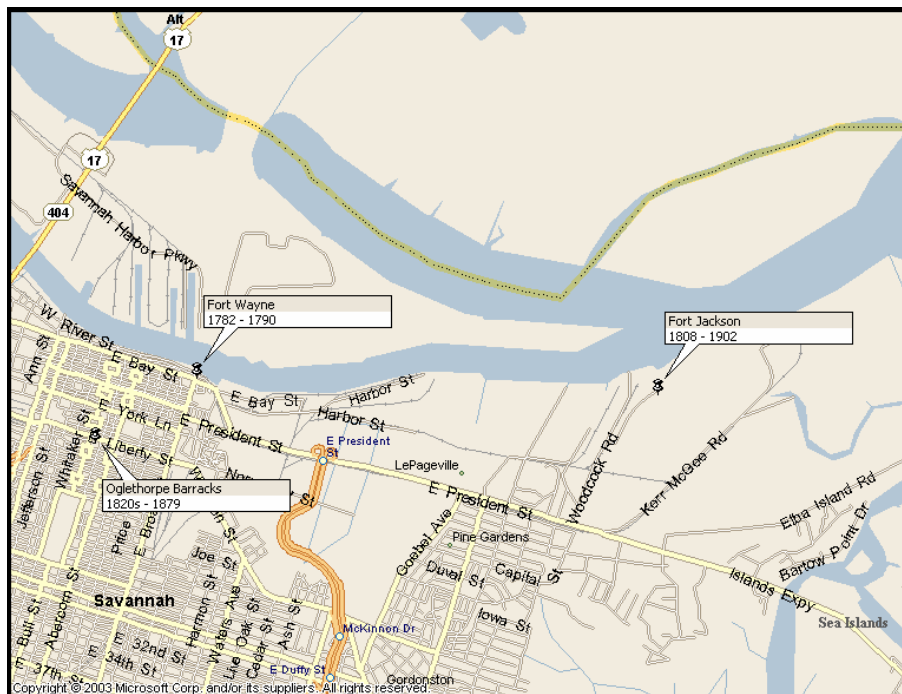


Figure 1. Location of Fort Jackson, Fort Wayne, and Oglethorpe Barracks. North is at the top of the page. Plotted on a current map of Savannah.

In 1823 the City of Savannah petitioned the Secretary of War to build a military barracks within the city and an agreement was struck. The city furnished the land and the U.S. government furnished the materials and soldiers to build the barracks. Work was commenced in the 1820s and Oglethorpe Barracks were completed around 1834.

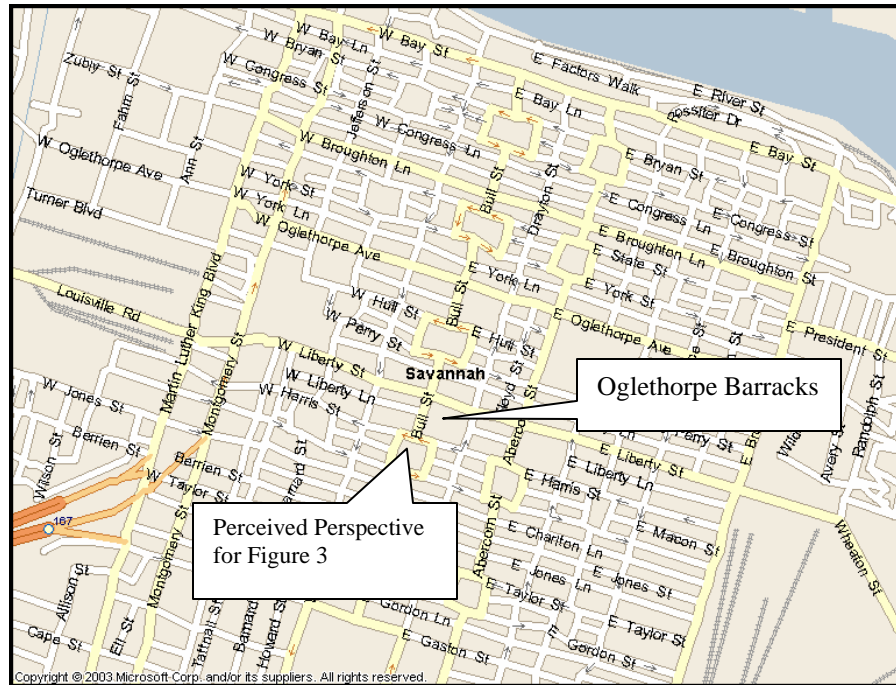
Based on sketchy records, it appears U.S. troops occupied Oglethorpe Barracks during the fort's construction in the mid to late 1820s, through completion in the mid 1830s, and until around 1850. It appears Federal troops vacated the barracks around 1850, and in 1852, the city of Savannah proposed to purchase the site from the U. S. government. In 1853 the U.S. Government honored the city's wish. During the Civil War, Oglethorpe Barracks was occupied by local military volunteer companies until captured by Union troops in 1864. Following the Civil War, the barracks were again occupied by Union troops until 1879.

The barracks were sold to the Savannah Hotel Corporation for \$75,000 in 1879 and subsequently torn down to make room for the Desoto Hotel. Construction on the Desoto Hotel began in 1888 and was completed in 1890.

Goal of the Study

The goal of this study was to document the location and exposure of weather instruments at Oglethorpe Barracks, GA. The scope of this study primarily covered the 19th Century. Extrinsic observations related to the Army surgeons' weather observing program also were considered.

LOCATION OF OBSERVATIONS



The buildings of Oglethorpe Barracks surrounded a courtyard that served as a parade ground (Figure 3). The square containing the barracks was surrounded by a brick wall 10 feet high, except where the buildings lined up along the streets (The description of Oglethorpe Barracks in this section of the report was obtained from a War Department document entitled *A Report on the Hygiene of the United States Army with Descriptions of Military Posts*, published in 1875).

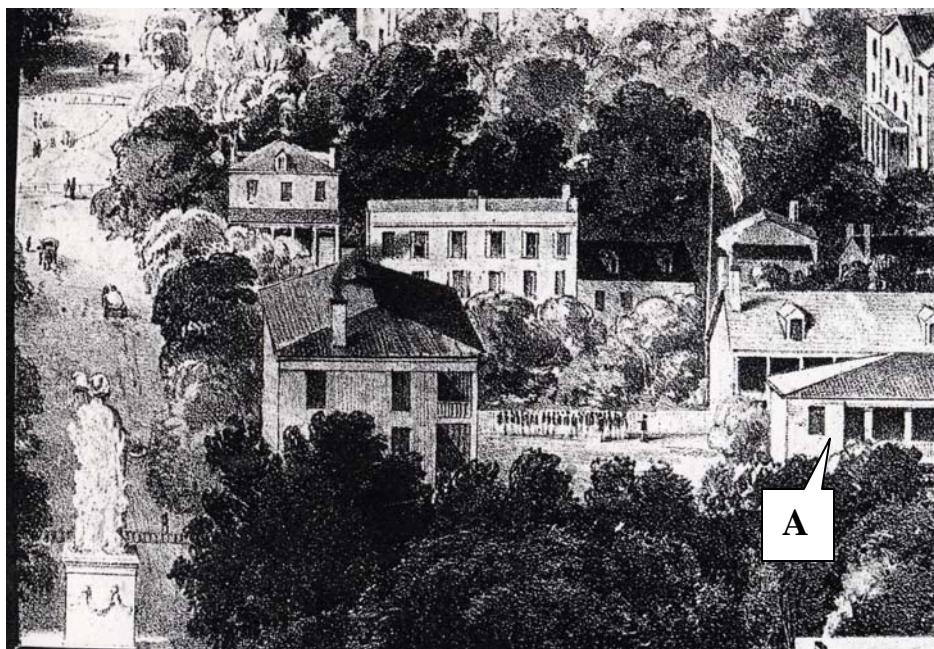


Figure 3. Drawing of Oglethorpe Barracks (circa 1866). Orientation of drawing not apparent, but indications are the view is towards the north, i.e., the street on the left is Bull Street. Building at point “A” may be the U.S. Army hospital. From the Georgia Historical Society.

Weather observations were taken by Army surgeons at the barracks hospital (based on information contained on observation forms). The post hospital was a frame building located on Harris Street. The hospital was 82 feet long, 40 feet wide, and 19 feet high. The hospital was on a brick foundation 11 feet high. The framework of the building projected 10 feet beyond the foundation at each end and was supported at those ends by square brick pillars (Reference was made to these brick pillars on the observation forms in 1875 with regard to exposure of the thermometers. See the section on Instrumentation Descriptions).

To the east of the hospital on Harris Street was a guard house, approximately 30 feet long, 30 feet wide, and 30 feet high. It was frame building two stories tall. To the west of the hospital on Harris Street was a brick building two stories tall.

INSTRUMENTATION

First weather observations in the NCDC (National Climatic Data Center) database for Oglethorpe Barracks are September 1866. However, other sources indicate that weather observations likely were taken much earlier. The document, *Meteorological Register*, published by the U.S. Army Surgeon General's Office in 1851, lists Oglethorpe Barracks as an observing site, and information from NARA (National Archives and Records Administration) indicates that weather observations were taken at the barracks as early as 1827, i.e., while the barracks was being built. A Signal Service document in the NCDC electronic database entitled "Index of Meteorological Observations Made in the State of Georgia From the Earliest Records to January 1, 1890" indicate weather observations were taken at Oglethorpe Barracks from January 1832 through December 1850.

The Georgia Historical Society in Savannah, GA possesses original meteorological observations for Savannah (listed in the Society's index under "Savannah Meteorological Tables, MS 700") not currently depicted in the NCDC electronic database. The observations were from January 1828 through December 1828 and January 1836 through December 1836. The format was consistent with that used by Army surgeons for the relevant periods. No specific location was indicated on the forms, either by street names or by latitude/longitude, other than the word, "Savannah." Most likely, these observations were made at Oglethorpe Barracks; although the possibility exists the observations were taken at Fort Jackson (or possibly at the barracks outside of old Fort Wayne).

The 1828 observations at the Georgia Historical Society were recorded at 7:00 a.m., 2:00 p.m., and 9:00 p.m. for temperature with one observation daily for wind and weather. Observations in 1836 were recorded at "Morning," "2 PM," and "Evening" for temperature with observations for wind and weather at "AM" and "PM." One daily rainfall amount was recorded in 1836. This was the same format used by field Army surgeons.

A note was placed in the folder with the observations that stated:

"Typed copies of these records on file at the National Weather Records Center, Asheville, N.C. with carbon copies of this typing at Weather Bureau Airport Station, Savannah, GA."

These observations could not be found in the NCDC electronic database.

Information regarding general instructions on weather instruments used by Army surgeons, and exposure of the instruments during the early to mid 1800s is contained in the report (under this general contract) on Fort Gibson, OK (see Bibliography). The general instructions listed in the Fort Gibson report also applied to

Oglethorpe Barracks after the Civil War, i.e., the time of observations in the NCDC database (after 1866).

Based on initial records in the NCDC database for Oglethorpe Barracks, i.e., after September 1866, the barracks had an exposed thermometer, psychrometer, and some form of wind vane. This site had no barometer through the time of available weather records in NCDC, i.e., September 1866 through March 1879.

Thermometer (Exposed and Wet Bulb)

Prior to 10 August 1868, Army field surgeons were given considerable flexibility by the Surgeon General's Office in placing the station's detached (or exposed) thermometer. Instructions issued to field surgeons before 1868 by the Army Surgeon General stated the following:

“The Thermometer will be placed in a situation having a free circulation of air, not exposed to the direct or reflected rays of the sun, and sheltered from rain. Its situation should be remote from massy walls, which slowly imbibe or part with caloric. In making observations avoid breathing on the instrument, or touching it; and at night manage your lamp so as not to cause a rise of the mercury by its heat.”

On 10 August 1868, the following instructions were issued to Army field surgeons by the Surgeon General's Office regarding thermometer placement:

“The thermometer should be placed in the open air, but under a roof of some kind, and should be well sheltered toward the South. It should be protected not only from the direct rays of the sun, but from the influences of all surfaces which strongly reflect the sun's heat, and of all bodies, such as thick walls, large rocks, etc., which become great reservoirs of heat during the day, and of cold during the night.’

‘...The height which it is deemed best to fix upon is that of four feet from the ground to the thermometer bulb, and the surface under the thermometer should be of short grass, sufficiently exposed to the sun and wind to keep it from habitual dampness.’

‘A thermometer box, in which most of the thermometers observed and recorded at the station are suspended, is generally used for the best conducted meteorological observations, and one should be made and set up at every post where there are means of constructing it. This box, which should be at least two feet square, is preferably made of louver-boards or overlapping slates, but ordinary boards pierced with numerous half inch holes may be used instead. It should be open at the bottom, and have a roof which will shed rain. One of the sides should be hinged for convenience of access to the interior, or the box may be left permanently open toward the North, a piece of board or of canvas being used to

protect it against driving winds from that quarter. This box is to be well secured on posts, at the proper height from the ground. It should be sheltered from the sun between sunrise and 7 AM, and between 11 AM and 3 PM, special screens being erected for the purpose if necessary. These screens, as well as the box itself, should be whitewashed or painted white.”

Maximum and minimum thermometers were provided to the Army surgeons at Oglethorpe Barracks in September 1871, and maximum/minimum temperatures were recorded. The Surgeon General’s instructions in 1868 described the instruments and how they were to be exposed:

“Maxim and minimum registering thermometers will be supplied to certain posts for the purpose of enabling the greatest cold of the night and the greatest heat of the day to be recorded. They are to be hung in a horizontal position, and observed once a day, preferably in the morning, when they will give the minimum of the preceding night and the maximum of the preceding day. After the readings have been taken the instruments are to be set and not disturbed until the same time the next day.’

‘The maximum thermometer is of the same plan as the maximum clinical thermometer furnished to Medical Officers, and special instructions will be sent with it when issued.’

‘The minimum is a spirit thermometer, in the bore of which a double-headed rod of black enamel floats. This rod or index is drawn back when the alcohol recedes, by reason of the resistance of the surface of the liquid to rupture or change of form, and thus reaches the lowest point to which the thermometer falls...”

A note on the November 1871, form stated, “Minimum thermometer was stolen on the evening of Nov 7th.” No minimum temperature readings were recorded until 18 March 1873.

The following note was listed on the October 1875, and December 1875, forms, “The thermometers in use are not kept in the prescribed thermometer box, but are affixed to a brick pillar that supports the hospital veranda. They probably do not register the extremes as fairly as if properly placed.”

Psychrometer

Instructions issued to the surgeons at Oglethorpe Barracks prior to 1868 with regard to the psychrometer contained the following:

“The hygrometer adopted by this Department consists essentially of a thermometer, the bulb of which is covered with floss silk enclosed in a piece of thin muslin, the ends of the silk sufficiently long to dip into water contained in a brass reservoir secured immediately below the bulb. In the top of this reservoir is

a small opening to admit the silk, and to the front is attached a cylinder communicating with the interior by a small hole. The reservoir is to be kept always supplied with water poured into it through the cylinder, and the bulb will be constantly moistened by capillary absorption.”

The 1868 instructions elaborated on taking wet-bulb temperatures:

“An apparatus for swinging a pair of thermometers – a wet and dry bulb – has been constructed at this Office, and will be issued to a certain number of posts for making specially accurate observations. In using this apparatus the covering of the wet bulb is to be moistened with a soft brush before each observation, and the apparatus then whirled round for a few minutes...’

‘When a stationary wet bulb is used it is to be placed in the box with the other thermometers, but far enough from them not to communicate cold to their bulbs. All casings around the lower part of such a thermometer should be removed, and a piece of wick which dips by one end into a receptacle of rain water, should have its other end coiled around the stem and resting on the top of the bulb, in such a way as to keep the muslin covering uniformly and sufficiently wet. If the wick is connected with the lower part of the bulb, the wetting is more apt to be unequal.”

On the June 1874, form, the following note appeared, “Dry and wet bulb thermometers condemned.” After June 1874, no hydrometric readings were recorded in the NCDC database, i.e., through 31 March 1879. From June 1874, through March 1879, notes occasionally were attached to the forms stating, “No dry and wet bulb thermometers at the post.” Exposed temperatures continued to be recorded during this period.

Rain Gage

Surgeons at Oglethorpe Barracks did not begin measuring rainfall until October 1868. Up until that date, only the beginning and end of rain was recorded. In 1868, the following instructions from the Army Surgeon General were in effect:

“The rain gauge now issued by the Department is a brass cylinder seven and a half inches high, and with a diameter at its mouth of one and ninety-seven hundredths (1.97) of an inch; this diameter being fixed upon for the reason that one inch of rain falling through such an aperture will measure exactly fifty cubic centimeters (50 cc), and centimeter graduates are furnished with each gauge for the purpose of making such measurements.’

‘The most desirable place for a rain gauge, other things being equal, is at the surface of the ground, but since it is not easy to protect an instrument in that situation, the gauge will be placed on the top of a post eight feet high,...’

‘For measuring very heavy snow falls, a snow gauge must be used having a mouth of the same size with that of the rain-gauge, but wider at the bottom, so as not to be easily overfilled. The snow which falls in it is to be melted and measured in the centimeter graduate.’

Wind Instruments

Accessible documents suggest that no wind instruments were available to Army field surgeons prior to the 1860s. Instructions from the Surgeon General’s Office prior to 1868 provided guidelines for subjective wind observations. Wind directions were to be expressed by points on a compass, as done by observing the general direction from which the wind was blowing, and wind force was to be expressed by a subjective scale ranging from 0 to 10 (e.g., “A gentle breeze” for a scale value of “2,” “A brisk breeze” for a scale value of “4,” and a scale of “6” for “A very strong wind”). No definitions for these terms have been found. These guidelines appeared to have remained in effect until the late 1860s.

Records in the NCDC database for Oglethorpe Barracks prior to August 1867, contain observed wind directions with no values listed for wind force. Beginning August 1867, wind force values also were recorded.

Instructions from the Surgeon General’s Office issued on 10 August 1868, provided the following descriptions regarding wind instruments:

‘The direction of the wind is to be determined in the usual way by a vane or weathercock placed as far above the ground as practicable and at a distance from all buildings, trees, etc., higher than itself. The staff of the wind vane should have attached to it bars indicating the direction of each of the four points of the compass.’

‘Anemometers, or instruments for measuring the velocity of the wind, with instructions for their use, will be issued by the Department to those posts where observations on the winds are of the most importance.’

‘Where special instruments are not furnished for the purpose, the velocity of the wind may be estimated by observing the horizontal motion of light bodies – as clouds of smoke, the pollen of plants, handkerchiefs thrown in the air, etc., when blown before the wind. A motion of one yard per second may be estimated as equal to two miles per hour.’

‘If means can be found for estimating the pressure on a surface of known size, as on a piece of board held perpendicularly to the direction of the wind, or an open umbrella with its concave surface toward the wind, the velocity may be calculated from it. The square root of two hundred times the pressure expressed in pounds per square foot, will give the velocity expressed in miles per hour.’

The wind scale in the 1868 instructions to field surgeons changed to reflect quantitative values, e.g., a scale value of “2” represented a wind speed between 5 and 10 mile per hour, a scale value of “4” represented a wind speed between 15 and 20 miles per hour, and a scale value of “8” represented winds between 50 and 60 miles per hour.

From August through November 1876, a number of observations were not taken by the surgeons at Oglethorpe Barracks because they were not in camp. When this occurred, the surgeons indicated on the observation forms that observations by the Signal Service office were used. For example, the note in August 1876, stated: “Command transferred to Camp Oglethorpe, Oliver, Georgia, 29 August and the observations in red ink transcribed from the Signal records on its return.” In September 1876, a similar note was attached, “The command being absent in camp during September, no observations were taken at Oglethorpe Barracks. The figures in red ink were obtained from the Signal Station, Savannah after our return and are entered to preserve the continuity of the record.” Analogous notes were written on the October 1876, and November 1876, forms.

BIBLIOGRAPHY

References

- Army Surgeon General, 1844. *Directions for Taking Meteorological Observations Adopted by the Medical Department of the United States Army*. War Department, Government Printing Office, Washington.
- Army Surgeon General, 1845. *Annual Report of the Army Surgeon General, 1844*. War Department, Government Printing Office, Washington.
- Army Surgeon General, 1850. *Regulations for the Medical Department of the Army*. War Department, C. Alexander Printer, Washington.
- Army Surgeon General, 1851. *Meteorological Register from 1831 to 1842 Inclusive*. War Department, C. Alexander Printer, Washington.
- Army Surgeon General, 1856. *Regulations for the Medical Department of the Army*. U.S. Army Surgeon General's Office. War Department, Government Printing Office, Washington.
- Army Surgeon General, 1868. *Barometers*. War Department, Government Printing Office, Washington D.C.
- Army Surgeon General, 1868. *General Meteorological Instructions*. War Department, Government Printing Office, Washington D.C.
- Army Surgeon General, 1875. *Hygiene of the United States Army, with Descriptions of Military Posts*. War Department, Government Printing Office, Washington.
- Hume, Edgar Erskine, Lieutenant Colonel (U. S. Army), August 1940. *The Foundation of American Meteorology by the United States Army Medical Department*. Military Surgeon v87, pp 89-118.
- Midwestern Regional Climate Center (Gary Grice), 2005. *The History of Weather Observing in Fort Gibson, Oklahoma 1824-1890*. National Climatic Data Center.

Appendix

Appendix 1 Methodology

Specific information regarding weather instrument location and exposure at Oglethorpe Barracks during observations by Army surgeons was almost non-existent. The NCDC database was the primary source of weather observations for this report. The only exceptions were original weather observations for 1828 and 1836 found in the Georgia Historical Society. The format and observed parameters strongly indicated the observations were taken by Army surgeons, but only “Savannah” was listed on the form. Most likely, these observations were taken at Oglethorpe Barracks.

General information regarding weather instruments used by the Army surgeons and procedures used to take the observations came from publications by the Army Surgeon General’s Office (1844, 1850, 1851, 1856, and 1868) which provided instructions to be used by field surgeons. This general information was included with the assumption that the military surgeons followed those instructions closely.

Annual reports by the U.S. Army Surgeon General were reviewed for the years 1825 through 1875 with only bits and pieces of revealed information. The primary exception was the annual report for 1844 which contained a summary of instructions for taking weather observations; however, a more detailed document was obtained from the National Library of Medicine in Bethesda, MD. Several publications by the Army Surgeon General were obtained from the extensive government library microfiche collection at Oklahoma State University.

Very little specific information was found at the Georgia Historical Society or Savannah Public Library that was relevant to weather observing by Army surgeons at Oglethorpe Barracks. Other information and data sources checked (by person, telephone, or through the Internet) during this study were: the NOAA Library, Hargrett Rare Book and Manuscript Library at the University of Georgia, Savannah State University Library Archives, Georgia State Climatologist, the Digital Library of Georgia, State of Georgia Archives, State of Georgia Library, National Park Service at Fort Pulaski, the Coastal Heritage Society , and Georgia Southern University Library.